

An Address
ON THE
METHOD OF ZADIG IN MEDICINE.

DELIVERED AT THE INAUGURAL MEETING OF THE NORTH LONDON
MEDICO-CHIRURGICAL SOCIETY, ON THURSDAY, DEC. 17TH, 1891.

BY

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AN ADDRESS

ON THE

METHOD OF ZADIG IN MEDICINE.

MR. PRESIDENT AND GENTLEMEN,—Allow me, first of all, to thank you for the great honour you have done me in asking me to address you to-night. The choice of a subject has not been easy, and, in trying to select one, it occurred to me that perhaps no animal gets to its goal more quickly or more surely than the carrier pigeon; yet, when started on its homeward journey, it does not fly directly onwards, but first of all takes two or three preliminary circles, in order to ascertain its whereabouts and the direction in which to direct its flight. The time spent in doing this is very far from lost, and what occurs in the case of the carrier pigeon appears to happen also in the conduct of human affairs. A little while ago I was down in the country, and a nurseryman, a most intelligent and able man, gave me a few lessons on pruning. He told me first of all what to avoid, and then what to do. "Some people," he said, "when they want to prune a tree begin with the knife at once, and cut here and there, without having a definite idea of what they are to do. Now the proper way is to put your hands in your pockets, stand a little distance off, look at your tree, see what you want to do, and then set to work." In laboratory researches we find the same thing, and a few preliminary experiments are often very advantageous in



learning the methods of work, so that an apparent loss of time at the beginning is often a real saving both of time and trouble in the end. Now, as this is a new Society, it seemed to me that perhaps it might be better, instead of beginning with a definite medical subject, such as the pathology and treatment of some disease, to ask you rather to direct your thoughts to some general methods of investigation. Now one of the greatest losses in medicine is the loss of individual experience. We find that men most able and successful in the practice of their profession, in the recognition and treatment of disease, die and carry their knowledge away with them. Some men may record the cases they have seen, but comparatively few are able to record their experience in such a way as to make it thoroughly available for others. Various attempts have been made at different times to collect the experiences of medical men, especially those in general practice, and to put it in such a form as to be available for their colleagues.

In the years 1874-77,¹ in my capacity of editor of the *Practitioner*, I made an attempt to collect the experiences of practitioners by issuing a circular and asking for returns regarding the treatment of quinsy and sciatica. Answers were returned from all parts of the world, and these were collated and published. The advantage which was thus gained, however, seemed hardly enough to repay the time, trouble, and expense which these questions and returns necessitated, and the attempt was discontinued. A few years later another attempt was made on a very much larger scale by the Collective Investigation Committee of the British Medical Association, but after this had been continued for awhile it was also dropped. The same desire for the collection of information is shown, however, in the union

¹ *Practitioner*, Nov. 1874, vol. xiii., p. 308 ; vol. xvi., p. 41 ; vol. xviii., p. 107.

of medical men to form societies in which everyone shall profit by the experience of his neighbours. The formation of the present Society is another indication of the value of this form of collective investigation, and it seems to me rather important that at its commencement we should pause a while and take a glance round before proceeding with what one may term its proper work, the consideration of diseases and their treatment. The failure of collective investigation to bring out any great amount of information from the profession as a whole shows that the task is no easy one; and if I fail to trace out for you a complete course by which our end may be attained you will not, I am sure, blame me, but will rather sympathise with my attempt, and will each and all of you endeavour to carry out further than I may be able to do the search for such methods as will enable us to attain the end we all desire. It seems to me that one cause of failure is a want of exact analysis, which leads to a want of exact synthesis. I may illustrate this by the common observation that, when we wish to describe the face of someone, all we are able to recollect, or at least to put into words, are the general facts that the individual has two eyes, a nose, and a mouth, with hair of a more or less pronounced colour. If we try to describe him more accurately, we may possibly recollect that his eyes are sleepy or bright, that his face is stout or thin, that his nose is long or short, that his chin is projecting or not. But here most of us would have exhausted our stock of reminiscences. Now, it is frequently very important that a face should be so exactly described that the owner of it may be at once recognised, and for this purpose a plan has been adopted in France of photographing the front face and the profile. The enormous number of photographs which are thus accumulated, of criminals and others in whom the officers of

the law take an interest, is so great that it would be impossible either to pitch upon the particular photograph that was wanted or to recognise the individual if it were not for a system of arrangement. All profiles may be at once divided into three classes, according as the base line of the nose is ascending, horizontal, or drooping—and each of these may be further subdivided according as the bridge is convex, straight, or concave. When to these are added similar subdivisions, according to the shape of the eye and the ear, we see at once that the whole of the photographs may be readily classified, and any individual one that is wanted may be picked out from amongst thousands of others at a moment's notice. Many people remember faces sufficiently well to recognise them when they see them again, but not to describe them, much less draw a portrait from memory; yet it is by teaching the law officers to describe portraits from memory that they are trained to recognise from the photographs the people who may be "wanted." It appears to me that one of the kinds of training that is needed by medical men is this power of learning to differentiate the characteristics of a patient, the symptoms he presents, and the effects of treatment upon him in such a way as to render any case presenting similar features readily recognisable by a fellow practitioner.

But it is not only the outward signs that we have to differentiate in this way. We are obliged in medicine to judge of the unseen from the seen, and from the objective data which are presented to our senses we must draw conclusions regarding the processes which are going on, or have already gone on, in the persons of our patients. We must, in fact, track symptoms which we see back to their causes. Now this process of "tracking" appears to me to be a fundamental one in man, and one

which seems really to be a remnant of the qualities possessed by our pre-historic ancestors. According to Haeckel, man runs through in his embryonic condition the history of the development of the race from a simple unicellular organism up to the human being. But even after birth traces of simian ancestry still appear. We have all noticed that when an infant is warming its feet before a fire the soles are not held straight forwards like those of an adult, but are turned in towards one another, and the great toes are drawn apart from the others in very much the same position as the feet of a monkey. Lately, too, Dr. Louis Robinson has shown that the arms of infants have an extraordinary power of supporting the weight of the body, and in this characteristic also an infant resembles the monkey. Even in adult life the position of the feet which we notice so easily in infants is retained by many, and we often find that the soles of people's boots are worn more on the outer than on the inner edge, the feet still tending to turn inwards, though only to a slight extent. The same tendency to reversion which we notice in the feet may be observed, I think, also in the faculties of the mind ; and the keen interest in tracking game by which prehistoric man was enabled to exist still evidences itself in the intense eagerness with which boys will read in Cooper's novels about Indians following a trail, or adults will pore over Gaborian's stories of the police on the track of a criminal. There can be little doubt, I think, that the profession of medicine is a most intensely interesting one, and I am inclined to think that its special charm is, to some extent at least, due to the fact that it is constantly demanding the exercise of those qualities of tracking which we find in Cooper's Indian heroes. I know of no better example of the exercise of those faculties than that narrated by Voltaire in his story of Zadig. I thought it was an original idea of my

own to point out the application of this method to medicine, but I find that I am only a humble follower of Professor Huxley, who has already written upon the applications of the method of Zadig to biology and palæontology.²

Zadig was a young man who, disgusted with life, retired from Babylon to a lonely place on the banks of the Euphrates, and there studied animals and plants until he saw a thousand differences where others could only see uniformity. One day one of the Queen's eunuchs, followed by a band of officials, came hastening past and asked Zadig: "Have you seen the Queen's dog?" Zadig modestly answered, "A bitch, I think; not a dog." "Quite right," said the eunuch; and Zadig continued, "A very small spaniel, has lately had puppies, limps with the left fore foot, and has very long ears." "You have seen her, then," said the eunuch. "No," said Zadig, "I have never seen her, and did not even know that the Queen had a dog at all." At the same time the finest horse in the King's stables ran away, and the chief huntsman, when seeking it, also made inquiries of Zadig, who said: "A first-rate galloper, five feet high, small hoofed, tail three feet and a half long, cheek-pieces of the bit are of twenty-three-carat gold and the shoes silver." "Where is he?" cried the chief huntsman. "I have not seen him and never heard of him before," said Zadig. Naturally enough he was suspected of having stolen both the spaniel and the horse, and was tried and condemned; but no sooner was sentence pronounced than both the missing animals were found. Zadig was then asked to explain how he knew so much about them without having seen them, and this, he said, was the way. He noticed one day in the sand the tracks of an animal, which he easily recognised as those of a small dog. Long

² On the Method of Zadig. Nineteenth Century, 1880. Reprinted in Science and Culture.

faint streaks on the ridges of sand between the foot-prints indicated that it was a bitch with pendent dugs, showing that she had had puppies shortly before. Other marks on the surface of the sand close to the prints of the forefeet indicated that she had very long ears, and one of the footprints being fainter than the others showed that she was slightly lame. As for the horse, the marks of his hoofs were all equi distant, showing that he was a famous galloper. In a narrow alley the dust on the trunks of the trees was disturbed at three feet and a half from the middle of the path. This showed the length of his tail, which had swept the trees as he lashed it from side to side. Branches of the trees met overhead at a height of five feet, and under them were some newly fallen leaves, showing that the horse had brushed against them, and was therefore five feet high. As to his bit, he had rubbed it against a stone, which Zadig recognised as a touchstone, and his shoes had left such marks on pebbles of another kind as showed they were made of fine silver.

A story very like that of Zadig's is told of an old fakir in the Syrian desert. He was one day visited by several Arabs, who asked him whether he had seen their lost camel. "It was very tall," said the fakir, "it was blind of the right eye, it had lost one of its front teeth, and it was laden on the one side with honey and on the other with corn." "Yes," said the Arabs, "that is exactly the camel; you have mentioned every point about it. Where is it?" "I have never seen your camel," said the fakir. "But if you have not seen it," said the Arabs, "how can you know all about it?" "I knew that it was a very tall camel because the tracks of its steps in the sand were further apart than those of an ordinary-sized camel. I knew it was blind of the right eye because it had cropped the herbage only on its left side, and I knew that it had lost one of its front tee:h

because in the middle of every bite that it had taken there was a small uncut part corresponding to where the tooth ought to have been. I knew that it had been loaded with honey on the one side and with corn on the other because I saw flies buzzing round one side of the track and ants busy on the other carrying away grains of corn that had fallen from the load."

An admirable example of the application to medicine of this method of tracking used to be told with great gusto by my late friend, Dr. Milner Fothergill, and I regret greatly that I cannot tell it with the same power and vividness that he did. In the town of Leeds there once lived a quack who had received no professional instruction whatever, but was known far and wide for his wonderful cures, and especially for his power of diagnosing the diseases of patients whom he had never seen, by simply examining their urine. A celebrated surgeon, Mr. X——, wishing to see his method of working, desired to be present one day, and the quack readily acceded to his request, feeling much flattered that so great a man should patronise him. Shortly after Mr. X—— had taken his seat a woman came in with a bottle of urine, which she handed to the quack. He looked at her, then at the bottle, held it up between him and the light, shook it, and said: "Your husband's?" "Yes, sir." "He is a good deal older than you." "Yes, sir." "He is a tailor?" "Yes, sir." "He lives at Scarcroft?" "Yes, sir." "His bowels are obstinate?" "Yes, sir." "Here," he said handing her a box of pills, "tell him to take one of these pills every night for a week, and a big drink of cold water every morning, and he will soon be all right." No sooner had the woman gone out than Mr. X—— turned to the quack, curious to know how he had made out all this. "Well, you see," said the quack, "she was a young woman, and looked well and strong, and I guessed the water was

not hers. As I saw she had a wedding ring on her finger, I knew she was married, and I thought the chances were it was her husband's water. If he had been about the same age as she it was hardly likely that he was going to be ill either, so I guessed he was older. I knew he was a tailor because the bottle was not stopped with a cork, but with a bit of paper rolled up and tied round with a thread in a way that no one but a tailor could have done it. Tailors get no exercise, and consequently they are all very apt to be constipated. I was quite sure that he would be no exception to the rule, and so I gave him opening pills." "But how did you know she came from Scarcroft?" "Oh, Mr. X—, have you lived so long in Leeds and you don't know the colour of Scarcroft clay? It was the first thing I saw on her boots the moment she came in."

Now, of late years we have got so many new methods of investigation that we are sometimes apt to forget the old habits of close observation by which this quack made out so much, and proved himself, although without any diploma, a worthy descendant of the water doctor whose picture by Gerard Dow occupies such a distinguished place in the gallery of the Louvre. Without resorting to the plan of testing the urine, by which that water doctor and his brethren of the craft no doubt recognised the presence of sugar, he could learn a great deal from its simple appearance.

Some years ago, when staying in the country with a medical friend whose wife was boiling some eggs in the dining-room for breakfast, I said to her from the other side of the room, "You have cracked one of those eggs now." She said, "I don't think I have." On taking them out of the pan, however, she found that one of them was cracked. She wondered how I knew, but the explanation was simple enough. The pan had boiled over, but water would not have held the steam long enough to boil over, unless there

had been something in it to make the bubbles tenacious, and this could hardly be anything else but albumen which had escaped from a crack. In the same way, although the water doctor did not know about albumen, he probably recognised that the persistence of froth on the urine after shaking it was of somewhat ominous import, and that would lead him to give a guarded prognosis, just as one nowadays sometimes pities an old gentleman who unconsciously proclaims his precarious tenure of life by the froth he leaves behind him in a public urinal.

The water doctor may even have learned to associate this frothiness with nervous symptoms, such as restlessness, irritability of temper, and sudden outbursts of passion quite out of proportion to the amount of offence. I well remember an incident some fifteen years ago where an apparently causeless outburst of fury on the part of an ordinarily quiet man completely astonished all his friends, who only understood it when his subsequent illness and death showed that his sudden passion was but an indication of unsuspected disease. The steward of St. Bartholomew's Hospital, Mr. Mark Morris, a man of very keen observation, has told me that whenever a patient comes down to the office at 11 o'clock at night and wants to be discharged there and then, they know that he is suffering from cardiac disease. Perhaps the outburst of fury in the Emperor Theodosius,³ which resulted in the massacre of Thessalonica, was only an indication of the disease which later on resulted in dropsy and death.

The water doctor would be sure to divide his frothy urines into pale and dark, and he would know that these two corresponded to quite different types. The dark urine was probably passed by an individual who was short of breath, disposed to rest, and frequently drowsy. The pale urine

³ Gibbon's *Decline and Fall of the Roman Empire*, chap. xxvii.

would be passed either by an individual who rose in the morning with his eyelids swollen and puffy, and who was probably drooping and languid during the day, or by a person of quite a different stamp, energetic, irritable, restless, sleepless, always on the move, and driving on like a high-pressure engine. Further than that, perhaps, the water doctor might not go, but we know now that the dark, frothy urine has probably been passed by a man suffering from cardiac disease, while the pale urine is due to renal mischief; and the classical researches of Bright and others have shown us that the man with big eyelids has probably tubular nephritis, while one who drives himself and his neighbours without intermission suffers from contracting kidney. Nay more, physiological and pathological researches have taught us that the dark urine of cardiac disease is due to low tension in the arterial system in general and in the renal arteries in particular, so that the excretion of water is diminished, while the pale urine is due either to high tension in the arterial system, as in cases of gouty kidney, or to diminished power of excreting solids in chronic nephritis.

But there are other indications of disease which may sometimes be recognised without examining the urine, and I was greatly astonished by a man diagnosing albuminuria from the photograph of a patient, although there was no swelling whatever visible in the face. On inquiry afterwards I learned that the diagnosis was made from the glistening of the eye. A tendency to œdema had caused a reflection of light along the sclerotic, and this made the eye appear more brilliant than usual. We get a similar glistening of the eye as an effect of the emotion of compassion, in which the increased secretion of tears moistens the eyeball more than usual. An entirely different effect is produced by the emotion of anger, where the eye does not

glisten, but glitters, or by great grief, which renders the eyeball dull and lustreless. If we try to follow these appearances back to their physiological cause, we may find our attempt helped by considering a typical lack-lustre eye, such as that of a dead cod-fish. We see at once that the eyeball here is flaccid and its surface perhaps indented, instead of being tense, as it ought to be, and its surface smooth. We may imitate this condition very readily upon a child's indiarubber balloon. If we let the air out it at once becomes limp. If we blow it out it begins to shine, and the tighter we blow it the more does it reflect the light. The tension in the eyeball under ordinary conditions has a relation to the tension of the blood, and the bright eye indicates the stout heart which may win the fair lady, while the lack-lustre eye is associated with a feeble circulation, which frequently has its origin in the depressing emotions of sorrow or fear. The glittering which occurs in anger is, I think, part of the same physiological process by which the face in great anger becomes pale, and the blood becomes concentrated internally, ready to supply force to the muscles in a sudden attack upon the enemy. It has always seemed to me that Orchardson's wonderful picture of Voltaire complaining of the insult that had been offered to him would have been rendered still finer by a very minute touch of white upon the eyeball, to indicate the glitter of anger. The bright eye of consumption is familiar to us all, the high temperature so common in the disease tending to make the circulation more than usually rapid, the intellect often more keen, and the hopes more bright than in health, though the face may be emaciated and the body reduced almost to a skeleton. But if we find in a thin person a languid instead of a bright eye, we are led to look for the cause of the patient's leanness rather in want of food than in rapid combustion, and not unfrequently, if inquiry teaches us that the patient is able

to obtain food, we may diagnose either that he cannot eat or cannot digest.

Now it does not do to make one's diagnosis too rapidly, for otherwise one may fall into grievous error. I remember once a whole class of students standing round a man with a loud cardiac murmur, and one of his pupils much dilated. After many learned opinions had been expressed regarding his case, the man informed us that the eye over which we had been having such an animated discussion was a glass one. A similar occurrence happened to a learned professor. He was telling his students that he was able to discover this, that, and the other thing from the appearance of his patient's teeth. The woman took them out, and said, "Please, sir, I will hand them round; they might like to look at them closer." Yet, in spite of these risks incidental to all hasty observation, the habit of close attention to minute detail which this professor tried to inculcate was a most useful one, and many of those who scoffed at him five-and-twenty years ago have learned to respect and admire him.

The process of tracking disease to its cause will often help us greatly in treatment, for unless we can remove the cause all therapeutic measures may be useless. I remember on one occasion being consulted by a gentleman who was second in command in a department involving not only heavy work, but great worry. He was suffering from dyspepsia, and looked thin and worn. I examined him most carefully, and could find absolutely no cause for his symptoms. Knowing, however, the conditions under which he was working, I said to him, "How is your chief?" "He is not well." "Is he irritable?" "Yes, very." "Who is physicking him?" "Dr. So-and-so." I returned him his fee, and said, "Go to Dr. So-and-so and tell him to physic your chief; it is of no use for me to try to cure you with medicine." I met

my patient some time afterwards, who, with a sly glance at his chief, whispered to me, "Your prescription was very efficacious."

One of the best examples that I know of tracing symptoms to their cause is afforded by Weir Mitchell's observations on chorea and on neuralgic pains. During the American War he took great interest in cases of gunshot wounds, and especially those involving injury to nerves. After the war was over his patients were scattered far and wide over the continent of America. He was struck by the curious coincidence in the reports which he got from them, and observed that one day (to put it roughly) he might get letters from San Francisco, saying that his patients in that district were suffering from pains in their scars; next day he might get a packet from the neighbourhood of Denver, next day from Chicago, and next day from New York. He thus noticed that a wave of pain was passing across the country. He next obtained the meteorological records, and found that a wave of rain was passing across the country at the same time and with the same speed. By comparing the pain-area with the rain-area he noticed that the two were concentric, but that the pain-area had a much larger radius than the rain-area. Thus all the patients in the rain-area, when they felt twinges in their limbs, looking up at the sky, would say, "It is raining to-day, and that is the cause of my pains." But those in the part of the pain-area outside the rain-area, when they looked up, saw that the weather was fine, and could thus discover no cause for their sufferings, although these were due to meteorological disturbances just as much as those of their fellow-sufferers in the rain-area. The way in which Weir Mitchell showed the dependence of chorea on meteorological changes was almost as interesting as the relationship between pain and weather. He tabulated all the cases of chorea occurring in Philadelphia, and drew

out a chart to show them diagrammatically. He then got the meteorological records and tried to find what conditions caused an increase in the cases of chorea. He tried the mean daily range of the thermometer, the average temperature, the average barometric pressure, the relative humidity of the air, but little or no correspondence could be traced between the curves representing these different factors and the curve of chorea. The curve showing the amount of rain and snow in inches showed a slight general resemblance to that of chorea, the curve showing the days on which the rain or snow fell came still nearer, but the curve showing the number of storm centres passing within 400 miles of Philadelphia showed a likeness to the curve of chorea which was very remarkable. In the same way he showed that the curve of infantile palsy closely corresponded with the curve of temperature, though not precisely so. We now constantly receive from America telegraphic information of the approach of storms, and we may well fancy that the day is not far distant when warnings will be published in the newspapers, not only to seamen of approaching storms, but to invalids and people in general of the meteorological changes which will induce pain in some and nervous excitability in others, with perhaps an added hint that extra flannel should be worn by the former, and bromide of potassium or some other nervous sedative taken freely by the latter.

One of the commonest observations in medicine is that cases come in a run. In hospital practice this is very striking. On one day you will see a great number of cases of bronchitis, another day cases of diarrhoea, another day cases of rheumatism, and so on. It has seemed to me, for a good many years back, that a most useful study would be the connexion between such runs of cases of disease and meteorological condi-

tions. I may, perhaps, be allowed to suggest that such a society as the present might find this a useful branch of work, and one which would not entail a great deal of labour if it were properly done. Each week, or each fortnight perhaps, the members might jot down in one word the kind of cases of which they had seen most, and their individual notes might be classified, so as to give the general results, by some member chosen for the purpose. He would then be able readily to get the meteorological records, and by comparing these with the cases which had come in a run a relationship might be traced between the condition of the weather and the class of patients most affected. We are accustomed to warn patients suffering from pulmonary diseases, either phthisis or bronchitis, or from albuminuria, to avoid chills; but I do not think that the meteorological factors which give rise to exacerbation of symptoms in all these diseases have been at all satisfactorily determined as yet. The process of tracking might thus be advantageously followed, in regard to the external conditions giving rise to disease, by this Society, but the process ought not to end here; it ought to be followed onwards to the internal constitution of the patient. You will often hear people who do not believe much in doctors still say that they are unwilling to go to anyone else than the man who has attended them and their families for a long time, "because," they say, "he knows my constitution." If we try to analyse what they mean by this, I think we will find that "the constitution" implies the kind of reaction which occurs on the application of any external stimulus. Take three men belonging to different families, for example. Put them on the top of an omnibus and let them drive out on a rainy day, and with a cold wind blowing. One man comes home and has a bad bronchitis, the second an attack of sickness and diarrhœa, and the third gets an attack of rheumatic pains. The

meteorological conditions to which each man has been exposed were the same, but the results have been quite different, the difference depending upon the constitutions of the individuals. But people belonging to different families do not only react differently to meteorological conditions or to other causes of disease, they are also differently affected by remedies. One of these three men, for example, might tolerate with impunity, and indeed derive benefit from, large doses of arsenic which would cause sickness and diarrhœa in another ; while a second might get headache, deafness, and possibly a cutaneous rash from a quantity of quinine which would only produce a feeling of strength and well-being in another. It is the knowledge of the way in which different families will react to drugs that constitutes the most important part of the experience of an old practitioner, and which forms one of the greatest difficulties in the way of a medical man treating strangers satisfactorily and certainly. When a stranger comes before him presenting certain symptoms, he can only deal with the disease according to average rules, and yet this individual patient may present the exception to these rules, and consequently the treatment fails.

But it is not only in different families that we find drugs having a different action ; different individuals in the same family will not react always in the same way, either to the cause of disease or to the mode of treatment. Nay more, a further complexity is introduced by the fact that the same person will react differently in youth, manhood, and age to causes of disease and to remedies. We not infrequently find, for example, that a youth who has been liable to bronchitis presents symptoms of dyspepsia in middle age, and may again have a pulmonary affection in old age. If these variations in families and individuals could be traced to their origin the benefit conferred on practical medicine

would be immense. We should then be able to overcome satisfactorily one of the great difficulties which constantly meet us at the present time, and instead of simply *trying* our remedies, choosing first one and then another amongst those most likely to suit, we should then be able to select the drug most suited to any individual case with certainty, and treat the disease with success. In this attempt I think we may be greatly helped by the law of heredity. At present we acknowledge it to a certain extent. If a man's grandfather has been gouty we are not at all astonished at the reappearance of the gouty symptoms in the grandchild. If either the father or the mother has been consumptive we dread the same disease in their progeny; but if one child should resemble the consumptive mother and the other the hale and hearty father, we should use special care to guard against colds in the former, and have very much less fear of any tubercular tendency in the latter. We acknowledge, in fact, that the members of one family throw back to different ancestral strains either on the father's or the mother's side, and that they do this not only in external appearance, but in tendencies to disease, and this is still one of the points which wants close and careful investigation. The different tendencies of an individual in either childhood or age may be regarded as a kind of reversion to different ancestors at various periods of life. This has been beautifully put by Oliver Wendell Holmes in his novel "The Guardian Angel." The heroine of this story, Myrtle Hazard, runs away from home, and, floating down the river in a boat, sees at dusk, in an old Indian burying place, a curious vision. Around the burial mound various figures seem to flit, some thin and shadowy, others more substantial, but still misty; while others again appear almost as distinct as living men and women. She recognises, as one does in a dream, that these are her ancestors, the solid ones closely related to her in blood, while the thin and shadowy are far removed. Each ancestor has an existence in herself more or less definite according to the nearness or remoteness of blood. It is not necessary to trace our heroine through her various adventures; but at one time she develops suddenly and unexpectedly, under provocation,

the character of an Indian squaw from whom she is descended, and nearly slays a schoolfellow while they are acting together. Later on another ancestress, who was a famous beauty, appears in a dream, and for some time afterwards the heroine feels this beauty living within her and directing her actions ; while later still another ancestress, who has been a great saint, drives the capricious beauty out and leads the heroine in the way she should go.

As I have already said, Haeckel believes that during intra-uterine life the foetus rapidly runs through the development of the race up to mankind, and I think we may in after life trace the progress of the individual through various ancestors more and more slowly as he advances in years. In infancy and childhood we frequently notice how rapidly the features change, and friends will say at one visit how like the child is to some member of his father's family, while a week or two after they will notice a resemblance to someone of his mother's family. If this Society can gather together notes as to whether an individual presenting an unwonted reaction to medicine happens to resemble at the time someone either of his father's or his mother's family who had a similar peculiarity, a great step might be made.

This, however, is not all. We have next to try to trace why medicines act differently upon different families. It is just possible that this also is a case of reversion to a very far-off period ; indeed, before mankind had even reached the level of the monkey. Some years ago it occurred to me that one might possibly gain some information regarding the peculiar differences in the action of drugs on gouty and other individuals by comparing the effects of certain poisons or remedies upon such animals as rabbits, which excrete their nitrogenous waste in the form of urea, and pigeons, which excrete it in the form of solid urates. Now Weir Mitchell had shown that pigeons had a singular power of resistance to the action of opium, and can take large quantities of it without presenting any symptoms of narcosis. Dr. Cash and I made some experiments upon the subject, and we found that opium in moderate doses appeared to have almost no action upon

pigeons, yet on examining more closely we found that it had a very marked action, only it did not produce sopor, but caused the temperature to fall greatly. Instead of acting as a narcotic it acted as an antipyretic. We did not try the converse of this by giving antipyretics such as antipyrin to pigeons and seeing whether they acted as soporifics, but in patients we certainly do find that occasionally, as in acute inflammation, opium seems to have an antipyretic action, whereas antipyrin certainly acts at other times like a soporific. In order to track these actions further back still and find out what changes in the circulation, blood, nerve cells, and nerve fibres the action of these various drugs depends, a large amount of experimental work in laboratories is required.

Until lately there has been no opportunity for young men generally to do such work in this country, and those who wished to undertake it were obliged to go abroad. Now, however, owing to the wise action of the Colleges of Physicians and Surgeons, opportunities are being afforded for such investigations ; but all such researches will give only one side of the subject, and will remain valueless unless clinical observation can be brought to bear at the same time on therapeutic studies. The members of this Society, by the fact that they have founded it, have shown their desire to forward the progress of medicine. I have to-night tried, in a very imperfect way indeed, to consider some of the methods by which I have thought their objects might be to some extent attained ; and even if I should have failed to show you how to work, this evening may not have been uselessly spent if I have succeeded in directing your attention to the search after methods of attaining the objects which we all have at heart—that of securing health and ease to our patients with quickness and certainty.





